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(54) Apparatus for temporarily immobilizing a local area of tissue

(57) The invention is apparatus for performing beating heart surgery, in which a single articulating arm supports multiple suction pods. Once the suction pods are applied to the heart surface, tightening a cable fixes the arm in place. Then, the suction pods may be spread apart from each other to tighten the surface of the cardiac tissue lying between the suction pods. In one embodiment, fixation of the arm as well as the spreading apart of the suction pods may occur concurrently or almost concurrently through the tensioning of a single cable. Additional embodiments of the method, system and its components are shown.

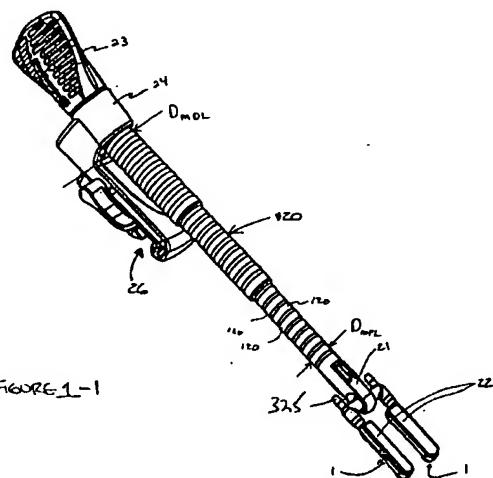


FIGURE 1-1

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EUROPEAN SEARCH REPORT

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
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Y	* column 37; figures 10B,30,42,65 *	63-67, 94,96	
A	* figures 33,75 *	29	
A	* figure 32C *	14	
X	* figure 32B *	12,57,58	
X	* figure 32C *	13,59	
	* figure 60 *		
X	* column 14, line 28 *	89,90	
A	* figures 18,44 *	93,99	
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		-/-	
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		26 April 2000	Barton, S
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons 8 : member of the same patent family, corresponding document			

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

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EUROPEAN SEARCH REPORT

Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT			
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The present search report has been drawn up for all claims			
Place of search EPO FORM 1503/82 (PMD/CT)	Date of completion of the search 26 April 2000	Examiner Barton, S	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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European Patent
OfficeLACK OF UNITY OF INVENTION
SHEET BApplication Number
EP 99 30 7331

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-11, 18-21, 45, 46, 78, 79, 82-88, 110, 114-118

Tissue immobilising system with movable paddles, in particular with a combination of malleable conforming and suction gripping

2. Claims: 1,22-25

Tissue immobilising system with movable paddles, with spreading means including a spreadable saddle

3. Claims: 1,29, 31-38

Tissue immobilising system with movable paddles, with independent spreading of first and second paddles

4. Claims: 1,14-17, 39-44, 47-52

Tissue immobilising system with movable paddles, with hinged spreading means

5. Claims: 1,53-56, 81

Tissue immobilising system with movable paddles, with simultaneous paddle spreading and arm locking

6. Claims: 1,12, 20, 30, 57, 58

Tissue immobilising system with movable paddles, with parallel paddle spreading

7. Claims: 1,13, 59-62

Tissue immobilising system with movable paddles, with non-parallel paddle spreading

8. Claims: 1,63-77

Tissue immobilising system with movable paddles, with multiple suction ports on a single surface

9. Claims: 1,80

Tissue immobilising system with movable paddles, with

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl7)
P, X	<p>EP 0 920 835 A (ETHICON) 9 June 1999 (1999-06-09) * paragraphs '0036!, '0040!; figures 12,13 *</p> <p>-----</p>	1,63	
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	26 April 2000	Barton, S	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons & : member of the same patent family, corresponding document	
<small>EPO FORM 153/3.82 (P04C01)</small>			

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European Patent
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SHEET BApplication Number
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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

special arrangement of suction source, suction port and paddle and port surfaces

10. Claims: 1,89-93,99-103

Tissue immobilising system with movable paddles, with special construction of flexible arm

11. Claims: 1,26-28,94-98,110-113,119-126

Tissue immobilising system with movable paddles, with spreading actuator remote from paddles

12. Claims: 1,104-109

Tissue immobilising system with movable paddles, with paddle with puncturing and dispensing capability

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ANNEX TO THE EUROPEAN SEARCH REPORT
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